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## (54) Mixed signaling device for rooms with mesopic lighting

(57) The invention relates to safety signaling.

The signaling device 10 for rooms with mesopic lighting comprises: a light-tight fixing box 12 that has a base and lateral walls practically perpendicular to the base; a light source 14 located inside the box 12; and a light opaque information panel 16 closing the upper part of the box and extending between the lateral walls. The device is characterized in that: the information panel comprises a symbol which is presented in the form of slots 50 whose width is between 0.5 mm and 1.5 mm to enable the light to escape from the box in diffuse form and whose luminance is between 0.02 cd/m<sup>2</sup> and 0.5 cd/m<sup>2</sup>. Advantageously, the light source emits radiation centered on 590 nm.

Application to displaying safety symbols in low light rooms.

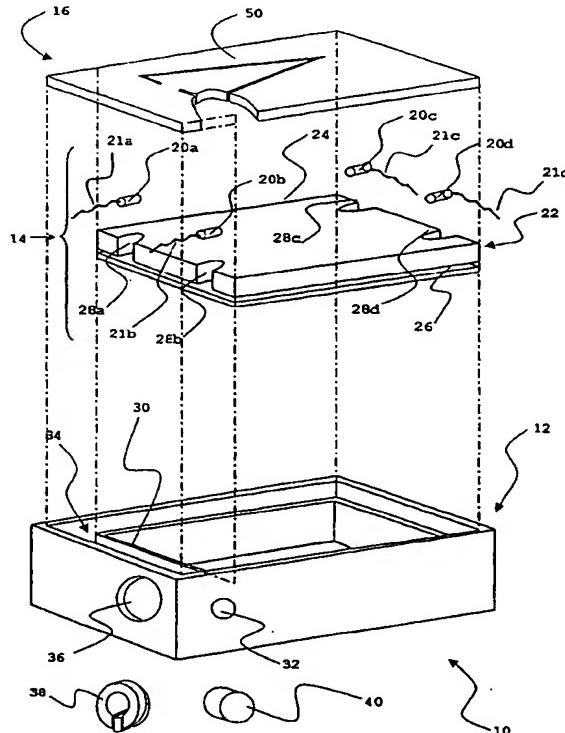


Fig. 1

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## Description

**[0001]** The present invention relates to safety signaling and more particularly in rooms that have relatively low main specific lighting.

**[0002]** It is well known that the manufacture of photographic products must be carried out in rooms with very low light. It often happens that the manufacturing and finishing operations for light sensitive photographic products take place in dark rooms in which the lighting is mesopic lighting. This is due to the fact that the light sensitive products are fogged with lighting that can be very low.

**[0003]** Safety regulations require employers to indicate the emergency exits to their personnel using permanent panels. In premises with mesopic lighting, it is necessary to illuminate such panels so that they can be seen.

**[0004]** Patents US 5,365,411 and US 5,105,568 describe signaling panels comprising a box surrounding a light source and a screen bearing the information to be displayed and having light transparent zones and arranged in front of the source so that the luminous information can be seen by an observer. In Patent US 5,105,568 the sources are arranged to surround the transparent zones. In Patent US 5,365,411 the sources are arranged on the edges of the box and the light is reflected and diffused to illuminate the information panel uniformly.

**[0005]** It is an object of the invention to produce a signaling device that can be used in a room with mesopic lighting to limit to the minimum the interference light caused by the presence of the device in the room.

**[0006]** It is another object of the invention to enable the utilization of the same device when the room is exceptionally illuminated with photopic light.

**[0007]** This object is achieved by means of a signaling device for rooms with mesopic lighting, comprising a light-tight box having a base, side walls practically perpendicular to the base, an upper part of the box extending between the side walls forming an light-opaque information panel, and a light source inside the box. The device is characterized in that the information panel comprises a symbol, which is in the form of slots whose width is between 0.5 mm and 1.5 mm to allow the light to escape from the box in diffused form, and whose luminance is between 0.02 cd/m<sup>2</sup> and 0.5 cd/m<sup>2</sup>.

**[0008]** In one advantageous embodiment, the light source emits radiation whose spectral width is relatively narrow and centered on 590 nm.

**[0009]** In another particularly advantageous embodiment, the information panel comprises one main side facing outwards and presenting, in photopic light, a background having a first appearance, and zones that surround the slots, which mark out the symbols represented by the slots, and which presents a second appearance, different from the first, so that the symbols formed by the zones can be seen in photopic lighting.

**[0010]** Other characteristics and advantages of the invention will appear on reading the description that follows making reference to the annexed drawings wherein the same references describe similar items.

5 **[0011]** Figure 1 represents diagrammatically an exploded view of the device according to the invention.

**[0012]** Figure 2 represents another embodiment of an information panel bearing a symbol.

10 **[0013]** As can be seen, Figure 1 represents an exploded view of a device 10 according to the invention. The device essentially comprises three parts: a box 12 containing a light source 14 closed by an information panel 16.

15 **[0014]** The box 12 is light-tight and has a base and lateral walls practically perpendicular to the base. It also comprises internal walls 30 whose utility will be explained below.

20 **[0015]** The information panel 16, which will be described in more detail below, closes the upper part of the box and enables legible information to be displayed such as for instance a symbol or text, for example an "EMERGENCY EXIT" sign or others. In the embodiment shown, the information panel presents a symbol in the form of an arrow.

25 **[0016]** The source 14 comprises a light source, represented in Figure 1 by four light-emitting diodes 20a to 20d, and a diffusing panel 22. The source 14, preferably diffuse, is fixed in the box 12 for instance by screws on the walls 30 located inside the box. Advantageously, the diffusing panel has a practically transparent element 24 in polycarbonate whose surface state is such that it produces diffusion phenomena at its surface. In one particularly advantageous embodiment, the surface of the main side of the polycarbonate element 24, which faces 30 inwards to the box, is covered by a white reflector screen 26 so that the light is sent back towards the exterior of the box. In the embodiment represented, the light-emitting diodes are arranged on the section of the screen 22 inside spaces 28a to 28d so that the maximum flux emitted by each diode is sent inside the polycarbonate element. It can be advantageous to provide reflector elements on the surrounds to the polycarbonate element 24 to increase the efficiency of the diffusing panel. The other main side, facing towards the information panel 35 has a diffusing surface.

40 **[0017]** The light-emitting diodes are linked to an energy source (not shown) by electrical connectors 21a to 21d. Advantageously, the electrical supply circuit (not shown and which can be arranged in a space 34 of the

45 box) comprises an adjustable potentiometer which can be accessed by means of the aperture 32 in the box 12. Advantageously the aperture 32 will be fitted with a plug 40, for instance in rubber, to conserve the light-tightness. In one embodiment, the energy is supplied from

50 an external source using an electrical connector (not shown) that penetrates into the box 12 through an aperture 36 fitted with a cable gland 38 to conserve the light-tightness.

**[0018]** The device, according to the invention, must prevent photographic products from fogging. Therefore, the illumination produced by the device 10 must be a minimum while enabling the displayed information to be "read". Thus light-emitting diodes 20a to 20d will be utilized whose emission wavelength is centered on 590 nm. To enable the information to be seen in a solid angle as large as possible, the luminous information will be supplied through a relatively narrow slot 50 that enables the light to escape from the box 12 in diffuse form; the panel 16 being made with light opaque material. In one particularly advantageous embodiment, the information carried by the panel 16 is presented in the form of straight segments or lines because its interpretation is easier. On the embodiment of the information panel 16 represented in Figure 1 and from which part has been removed to make it easier to understand the invention, only the slot 50 is shown. The width of the slot is between approximately 0.5 mm and 1.5 mm. The luminance of the slot will be adapted to the intended use according to the sensitivity of the photographic products and the distance separating the products from the source. It has been calculated that for employees working in a room with mesopic lighting approximately 5 m from the signaling panel, a source luminance of approximately 0.02 cd/m<sup>2</sup> would allow the symbol to be understood for a wavelength of 590 nm. It has been calculated that for another embodiment and in the same conditions, a source luminance of approximately 0.05 cd/m<sup>2</sup> would allow the symbol to be understood for a wavelength of 520 nm.

**[0019]** In another embodiment, represented in Figure 2, the information panel 16 has been modified to enable the information to be seen when the room has photopic lighting, for example for maintenance purposes. In this embodiment, the visible side of the panel 16, or background (54), presents, in photopic light, a first appearance. The slot 50 made in the panel 16 and marking the symbol is surrounded by the zone 52 presenting, in photopic light, a second appearance distinct from the first and marking out the symbol. The contrast between the first appearance and the second appearance is enough to enable good legibility of the information represented. In the embodiment utilized, the information panel is an engraving plate in plastic material having a thin layer, serving as a background, preferably green. The zone 52 was obtained by an engraving operation removing the green layer and exposing the white plastic material forming the information panel. The slot 50 was then made within the zone 52.

5 practically perpendicular to the base and an upper part of the box extending between the lateral walls and forming a light opaque information panel (16);  
a light source (14) inside the box;

a device characterized in that:

the information panel comprises a symbol that is presented in the form of slots (50) whose width is between 0.5 mm and 1.5 mm to enable the light to escape from the box in diffuse form, and whose luminance is between 0.02 cd/m<sup>2</sup> and 0.5 cd/m<sup>2</sup>.

10 2. A device according to Claim 1, wherein the light source emits radiation whose spectral width is relatively narrow and centered on 590 nm.

15 3. A device according to Claims 1 or 2, wherein the source (14) comprises light-emitting diodes (20a - 20d) and a diffusing panel (22).

20 4. A device according to Claim 3, wherein the diffusing panel presents a first main side facing inwards to the box and fitted with a screen (26) reflecting the light, and a second main side facing outwards to the information panel and having a diffusing surface to send a practically uniform diffuse light to the information panel.

25 5. A device according to Claim 2, wherein the information panel comprises one main side facing outwards presenting, in photopic light, a background (54) having a first appearance and zones (52) surrounding the slots and marking out the symbols represented by the slots, the zones having a second appearance different from the first so that the symbols formed by the zones can be seen in photopic light.

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## Claims

1. A signaling device (10) for rooms with mesopic lighting, comprising:

55 a light-tight box (12) having a base, lateral walls

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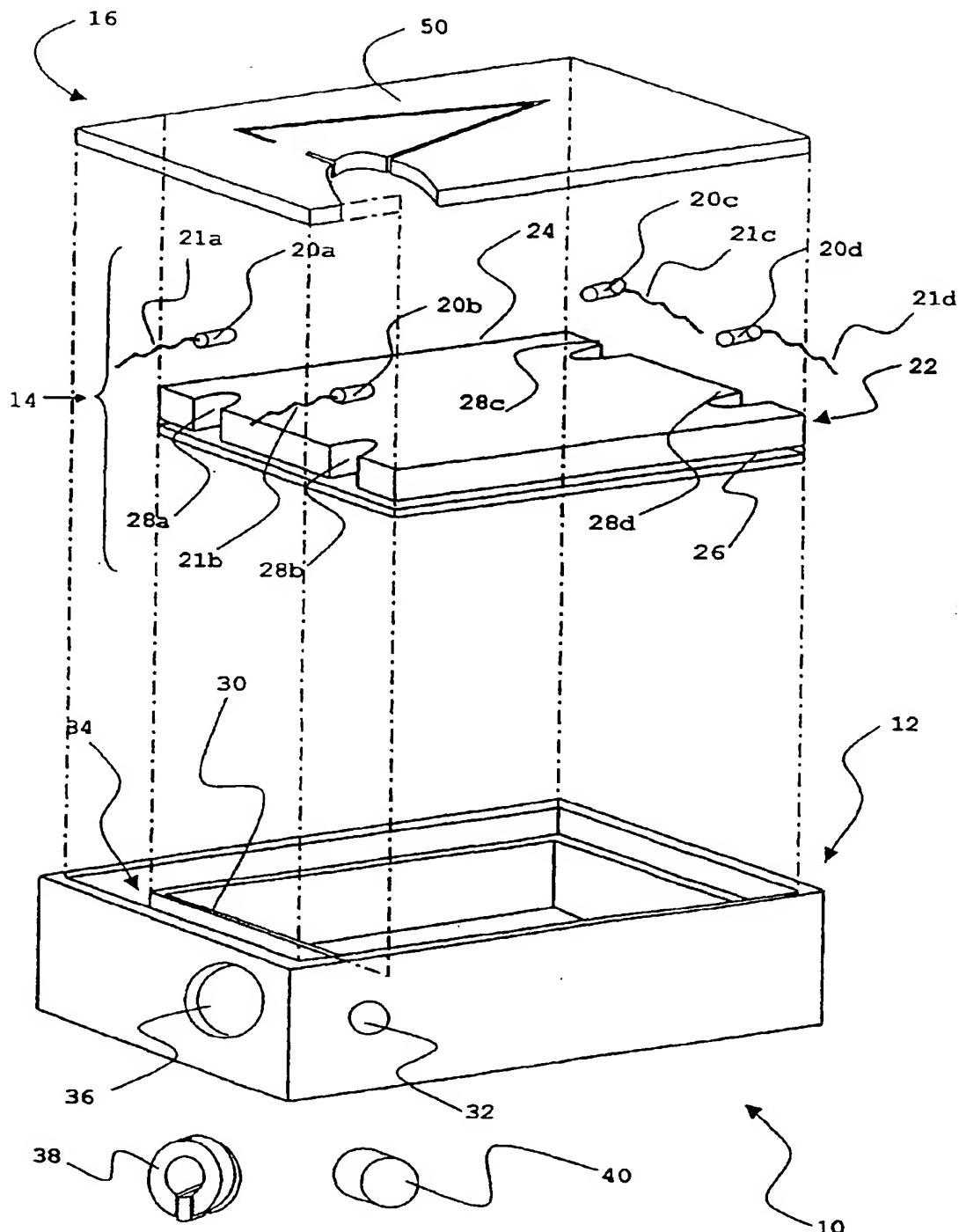


Fig. 1

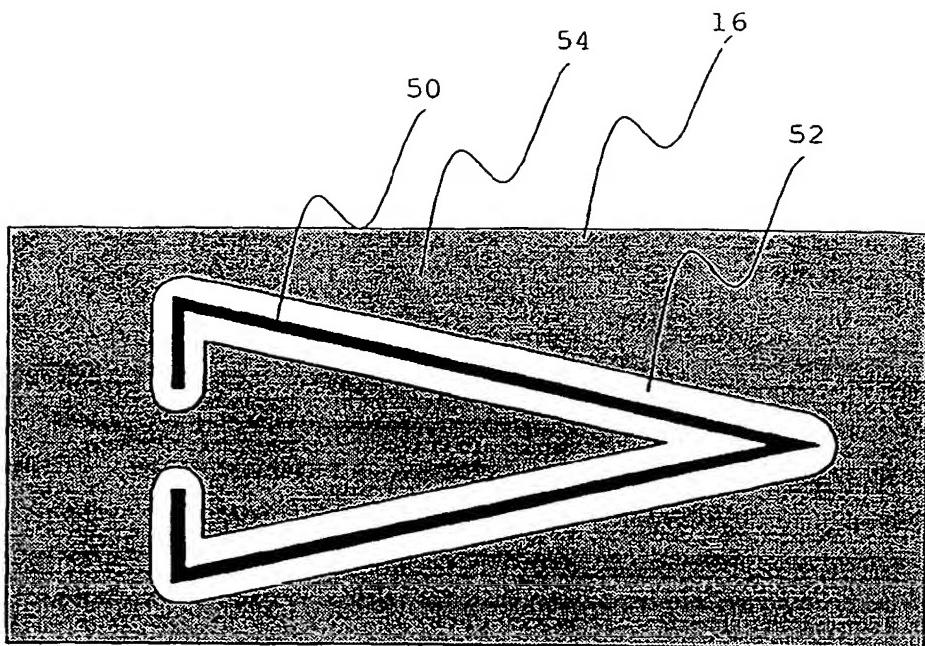


Fig. 2

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## EUROPEAN SEARCH REPORT

Application Number  
EP 00 42 0170

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Y	DE 41 09 532 A (TOYODA GOSEI KK) 2 October 1991 (1991-10-02) * column 3, line 48 - line 68 * * column 4, line 1 - line 5 * * figures 2,9 *	1-3	G09F13/06 G09F13/22 G09F19/12
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TECHNICAL FIELDS SEARCHED (Int.Cl.7)			
G09F F21V			
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	30 August 2000	Pantoja Conde, A	
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EP 00 42 0170

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
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30-08-2000

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